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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,758	03/31/2004	Samit Kumar Basu	140361-1/YOD GERD:0123	5263
6:147 7590 07/24/2009 GENERAL ELECTRIC COMPANY GLOBAL RESEARCH PATENT DOCKET RM. BLDG. K1-4A59 NISKAYUNA, NY 12309				
EXAMINER				
BITAR, NANCY				
ART UNIT		PAPER NUMBER		
2624				
NOTIFICATION DATE		DELIVERY MODE		
07/24/2009		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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# Office Action Summary

**Application No.**

10/813,758

**Applicant(s)**

BASU ET AL.

**Examiner**

NANCY BITAR

**Art Unit**

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on 28 April 2009.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 12-30 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 12-30 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 3/31/2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/CDC)  
4) ☐ Interview Summary (PTO-413)  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_  
Paper No(s)/Mail Date \_\_\_\_\_

**DETAILED ACTION**

***Response to Arguments***

1. Applicant's response to the last Office Action, filed 01/28/2009, has been entered and made of record.
2. Claims 12-30 are currently pending.
3. Applicants arguments filed 4/28/2009 have been fully considered and are persuasive but are moot in view of the new ground(s) of rejection.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 12-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shih et al ( US 2005/0152504) in view of Man et al ( US 7,023,951).

As to claim 12, Shih teaches a method for generating a variance map from measured projection data acquired from a tomography system comprising:  
accessing the measured projection data from the tomography system (A tomography system 100 comprises an imaging system 102; note that figure 3 teaches acquire an object projection of an object; 310); formulating a variance measure based upon the measured projection data (generating the variance reconstruction from the variance projections, paragraph [0010]); and

generating a variance map from the variance measure using a reconstruction algorithm (the variance projection includes an intensity map and positional data for the perspective that is common to the standard and object projections; note that 3D variance reconstruction of the variations between the object and the standard is generated, and the object is qualified based on the variance reconstruction, Paragraph [0043]) While Shih meets a number of the limitations of the claimed invention, as pointed out more fully above, Shih fails to specifically teach the variance map has been generated from variance measure. Specifically, Man et al. teaches receiving measured sinogram data from the computed tomography system. The sinogram data is representative of sinogram elements. The measured sinogram data is reconstructed to generate initial reconstructed image data. Then corrected sinogram data is generated using the measured sinogram data. The corrected sinogram data is iteratively reconstructed to generate an improved reconstructed image data based on a weight measure which are generally corresponded to a function that is inversely proportional to the variance wherein the weight measures are derived from the measured sinogram data by using a maximum likelihood (ML) or a maximum a posteriori (MAP) technique (abstract and column 6 lines 56-67). it would have been obvious to one of ordinary skill in the art to generate the variance map from the projection data as taught by Man et al since one would have been motivated to make such modification to reduce artifact thus improving image quality. Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

As to claim 13, Shih teaches determining variability of a mean pixel value caused by noise factors and artifact factors associated with the measured projection data based upon the variance measure (any pixel in the variance projection intensity map that exceeds a particular

threshold value can be a variant portion. Alternatively, a variant portion can be defined as any portion of the intensity map in which a threshold number of pixels within a given area each exceed threshold intensity. Threshold values, for example, can be fixed values or can be set by a user to vary the sensitivity. It will be appreciated that more complex algorithms can also be applied to identify variant portions, paragraph [0037]; figure 4).

As to claim 14, Shih teaches the method of claim 12, wherein formulating a variance measure is based on a statistical model (figure 4, 450,460,470; it is known to one skilled in the art that the numerical analyzer can include statistical model).

As to claim 15, Shih et al teaches the method of claim 12, wherein the reconstruction algorithm is a weighted filtered back projection reconstruction algorithm or a fast reconstruction algorithm such as a Fourier-based algorithm, a hierarchical algorithm, or a coarse reconstruction based on down sampled projection data and/or image data (paragraph [0037])

As to claim 17, Shih et al teaches the method of claim 15, wherein the reconstruction algorithm is adapted to operate on the variance measure to generate the variance map (It will be appreciated that more complex algorithms can also be applied to identify variant portions, paragraph [0037])

As to claim 18, Shih teaches the method of claim 12 further comprises displaying, analyzing or processing the variance map (figure 4, numerical analyzer).

As to claim 19, Shih teaches the method of claim 12, wherein the measured projection data is reconstructed to generate original image data and wherein the original image data is displayed or analyzed based upon or in conjunction with the variance map (a graphical user

interface can provide variance data to the operator. For example, a graphics generator of the numerical analyzer 470 can superimpose the variance reconstruction of the variations over a stored 3D reconstruction of the standard to provide the operator with a visual indication of the differences between the object and the standard, paragraph [0045]).

As to claim 20, Shih teaches the method of claim 12, further comprising identifying features of interest in the original image data based upon the variance map (identify variant portions of the variance projection, 340; figure 3).

The limitation of claims 21-24 has been addressed in claims 12-15

The limitation of claim 25 has been addressed in claim 17.

As to claim 26, Shih et al teaches the method of claim 21, wherein the measured projection data is reconstructed to generate original image data and wherein the original image data is displayed analyzed or processed based upon the variance map (a graphical user interface can provide variance data to the operator. For example, a graphics generator of the numerical analyzer 470 can superimpose the variance reconstruction of the variations over a stored 3D reconstruction of the standard to provide the operator with a visual indication of the differences between the object and the standard. The composite of the standard and variance reconstructions can be enhanced, for example through the use of colors or shading, to highlight defects for the operator. It will be appreciated that such graphics can also be displayed while object qualification is being determined automatically by the numerical analyzer 470, paragraph [0045]; figure 5; see also Man et al figure 1 and 6).

The limitation of claim 27 has been addressed in claim 20.

The limitation of claim 28 has been addressed above on that claim 18 is a system claim whereas claim 1 is a method claim .Therefore; claim 28 is analyzed as previously discussed.

The limitation of claims 29 and 30 has been addressed above

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NANCY BITAR whose telephone number is (571)270-1041. The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nancy Bitar/  
Examiner, Art Unit 2624

/VIKKRAM BALI/  
Supervisory Patent Examiner, Art Unit 2624